

WHAT IS CLAIMED IS:

1. A hydrogen producing device for supplying at least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce hydrogen by a specific chemical reaction, wherein:

for the at least one type of material, supply amount of each material is set by selecting one from two or more set values which are previously determined corresponding to required hydrogen production volumes; and

for the air, oxygen, or oxidizing agent, supply amount of the air, oxygen, or oxidizing agent is varied and controlled so that a temperature of the reaction part is within a preset temperature range.

2. A hydrogen producing device for supplying at least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce hydrogen by a specific chemical reaction, wherein:

for the at least one type of material, supply amount of each material is set by on/off combination of two or more valves each of which is capable of providing a preset flow; and

for the air, oxygen, or oxidizing agent, supply amount of the air, oxygen, or oxidizing agent is set by controlling opening of a variable-flow valve so that temperature of the reaction part is within a preset temperature range.

3. A hydrogen producing device for supplying at

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least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce hydrogen by a specific chemical reaction, wherein:

for the at least one type of material, supply amount of each material is set by on/of combination of two or more valves each of which is capable of providing a preset flow; and

for the air, oxygen, or oxidizing agent, supply amount is set by controlling a supply pressure of the air, oxygen, or oxidizing agent so that temperature of the reaction part is within a preset temperature range.

4. A hydrogen producing device for supplying at least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce hydrogen by a specific chemical reaction, wherein:

for the at least one type of material, supply amount of each material is set by on-off combination of two or more valves each of which is capable of providing a preset flow; and

for the air, oxygen, or oxidizing agent, supply amount of the air, oxygen, or oxidizing agent is set by controlling discharge of a discharge-controllable blower so that temperature of the reaction part is within a preset temperature range.

5. A hydrogen producing device for supplying at least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce

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hydrogen by a specific chemical reaction, wherein:

for the at least one type of material, supply amount of each material is set by selecting one from  $n_1$  set values which are previously determined corresponding to required hydrogen production volumes; and

for the air, oxygen, or oxidizing agent, supply amount of the air, oxygen, or oxidizing agent is set by selecting one from predetermined  $n_2$  set values,  $n_1$  being smaller than  $n_2$ .

6. A hydrogen producing device for supplying at least one type of material to a reaction part together with air, oxygen, or an oxidizing agent to produce hydrogen by a specific chemical reaction, wherein:

each of supply systems for the air, oxygen, or oxidizing agent and the at least one type of material is provided with flow setting means; and

flow setting is performed so that at least one of the flow setting means opens the supply system <sup>which</sup> during a second time period in a preset first time period and an average supply flow in the first time period becomes a desired value.

7. A hydrogen producing device as claimed in claim 6, wherein the second time period is varied depending on status of hydrogen production operation such as alteration of a required hydrogen production volume.

8. A hydrogen producing device as claimed in any one of claims 1-6, wherein the at least one type of

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material includes two types of materials which are water and methane.

9. A hydrogen producing device as claimed in any one of claims 1-6, wherein the at least one type of material includes two types of materials which are water and methanol.

10. A hydrogen producing device as claimed in any one of claims 1-6, wherein the at least one type of material includes one type of material which is an aqueous solution of methanol.

11. A hydrogen producing device as claimed in any one of claims 1-6, wherein the hydrogen producing device produces the hydrogen by a combined reforming method in which a combination of an exothermic reaction and an endothermic reaction is employed.

12. A hydrogen producing device as claimed in claim 1, 5 or 6, wherein at least one of the flow setting means provided to the supply systems for the air, oxygen, or oxidizing agent and the at least one type of material includes on-off valves connected in parallel.

13. A hydrogen producing device as claimed in claim 12, wherein at least one of the on-off valves is provided with a constant-flow valve connected in series with the on-off valves.

14. A hydrogen producing device as claimed in claim 12, wherein at least one of the on-off valves is provided with a governor connected in series with the

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on-off valves.

15. A hydrogen producing device as claimed in claim 12, wherein the flow setting means for the air, oxygen, or oxidizing agent is a discharge-controllable blower.

16. A fuel cell electric power generation system comprising a hydrogen producing device, for generating electric power using hydrogen produced by the hydrogen producing device as a raw material, wherein

the hydrogen producing device is implemented by the hydrogen producing device claimed in any one of claims 1-15.

17. A fuel cell electric power generation system as claimed in claim 16, wherein hydrogen storage means is provided after an outlet of the hydrogen producing device.

18. A distributed power source for home use or for buildings, comprising a hydrogen producing device and a fuel cell for generating electric power by use of hydrogen produced by the hydrogen producing device, wherein

the hydrogen producing device is implemented by the hydrogen producing device claimed in any one of claims 1-15; and

the fuel cell is implemented by a polymer electrolyte fuel cell.

19. A distributed power source as claimed in claim 18, further comprising means for recovering

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sub A2)

exhaust heat, which is generated in the fuel cell, by use of coolant, and using the recovered exhaust heat as hot water.

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